What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A power supply apparatus, comprising:

a first power supply circuit that converts a source voltage from a direct current power source into a first voltage and providing the first voltage to an output terminal; and

a second power supply circuit that converts the source voltage from the direct current power source into a second voltage and provides the second voltage to the output terminal, said second power supply circuit being controlled to be turned on and off;

the first power supply circuit further detecting voltage at the output terminal and, when the second power supply circuit is inactivated, providing the first voltage.

2. A power supply apparatus as defined in Claim 1, wherein the first power supply circuit adjusts an output current to the output terminal so that the voltage detected at the output terminal becomes equal to the first voltage, and the first voltage is smaller than the second voltage.

3. A power supply apparatus as defined in Claim 1, wherein the first power supply circuit includes a series regulator comprising:

a first reference voltage generator that generates a first reference voltage;

a first voltage divider that divides a voltage at the output terminal and provides a first divided voltage;

an output control transistor that controls output of a source current supplied by the direct current power source in accordance with a gate signal; and

a first operational amplifier that provides the gate signal to the output control transistor such that the first divided voltage from the first voltage divider becomes equal to the first reference voltage.

4. A power supply apparatus as defined in Claim 1, wherein the second power supply circuit includes a switching regulator comprising:

a second reference voltage generator that generates a second reference voltage;

a second voltage divider that divides a voltage at the output terminal and provides a second divided voltage;

a switching transistor that controls output of the source voltage supplied by the direct current power source in accordance with a gate signal;

a second operational amplifier that amplifies a difference in voltage between the second reference voltage and the second divided voltage;

a control circuit that changes its state according to a control signal into one of an active state in which the control circuit controls switching operations of the switching transistor in accordance with an output signal from the second operational amplifier and an inactive state in which the control circuit causes the switching transistor to turn off into an interrupted state; and

a smoothing circuit that smoothes a signal output from the switching transistor and provides a resultant signal to the output terminal.

5. A power supply apparatus as defined in Claim 1, wherein the second power supply circuit includes a series regulator comprising:

a third reference voltage generator that generates a third reference voltage;

a third voltage divider that divides a voltage at the output terminal and provides a third divided voltage;

an output control transistor that controls output of a source current supplied by the direct current power source in accordance with a gate signal; and

a third operational amplifier that provides the gate signal to the output control transistor such that the third divided voltage from the third voltage divider becomes equal to the third reference voltage.

6. A power supply apparatus as defined in Claim 4, wherein the first power supply circuit and a portion of the second power supply circuit including the second reference voltage generator, the second voltage divider, the second operational amplifier, and the control circuit are integrated into a single integrated circuit.

7. A power supply apparatus as defined in Claim 4, wherein the first power supply circuit and a portion of the second power supply circuit including the second

reference voltage generator, the second voltage divider, the switching transistor, the second operational amplifier, and the control circuit are integrated into a single integrated circuit.

8. A power supply apparatus as defined in Claim 4, wherein the smoothing circuit includes a transistor that is controlled by the control circuit to operate as a flywheel diode, and the first power supply circuit and a portion of the second power supply circuit including the second reference voltage generator, the second voltage divider, the second operational amplifier, the control circuit, and the transistor of the smoothing circuit are integrated into a single integrated circuit.

9. A power supply apparatus as defined in Claim 4, wherein the smoothing circuit includes a transistor that is controlled by the control circuit to operate as a flywheel diode, and the first power supply circuit and a portion of the second power supply circuit including the second reference voltage generator, the second voltage divider, the switching transistor, the second operational amplifier, the control circuit, and the transistor of the smoothing circuit are integrated into a single integrated circuit.

10. A power supply apparatus as defined in Claim 4, further comprising a switching element between an output port of the first power supply circuit and the output terminal, the switching element being turned off into an interrupted state while the second power supply circuit provides the second voltage.

11. A power supply apparatus as defined in Claim 10, wherein the switching element includes a diode connected in a forward direction between the output port of the first power supply circuit and the output terminal to allow current flow from the output port of the first power supply circuit to the output terminal.

12. A power supply apparatus as defined in Claim 10, wherein the first power supply circuit, the switching element, and a portion of the second power supply circuit including the second reference voltage generator, the second voltage divider, the second operational amplifier, and the control circuit are integrated into a single integrated circuit.

13. A power supply apparatus as defined in Claim 10, wherein the first power supply circuit, the switching element, and a portion of the second power supply circuit including the second reference voltage generator, the second voltage divider, the switching transistor, the second operational amplifier, and the control circuit are integrated into a single integrated circuit.

14. A power supply apparatus as defined in Claim 10, wherein the smoothing circuit includes a transistor that is controlled by the control circuit to operate as a flywheel diode, and wherein the first power supply circuit, the switching element, and a portion of the second power supply circuit including the second reference voltage generator, the second voltage divider, the second operational amplifier, the control circuit, and the transistor of the smoothing circuit are integrated into a single integrated circuit.

15. A power supply apparatus as defined in Claim 10, wherein the smoothing circuit includes a transistor that is controlled by the control circuit to operate as a flywheel diode, and wherein the first power supply circuit, switching element, and a portion of the second power supply circuit including the second reference voltage generator, the second voltage divider, the switching transistor, the second operational amplifier, the control circuit, and the transistor of the smoothing circuit are integrated into a single integrated circuit.

16. A power supplying method, comprising:

supplying a source voltage;

in response to voltage at an output terminal, converting the source voltage into a first voltage and providing the first voltage to the output terminal; and

in response to a control signal, converting the source voltage into a second voltage and providing the second voltage to the output terminal;

the first voltage being provided to the output terminal when the second voltage is not being provided to the output terminal.